

IN THE CLAIMS:

Claims 5, 8, 10, 23, 26, and 28 were previously cancelled. Claims 1, 13 and 14 have been amended herein. All of the pending claims are presented below. This listing of claims will replace all prior versions and listings of claims in the application. Please enter these claims as amended.

Listing of Claims:

1. (Currently amended) A method of preparing a thermoplastic elastomer, comprising:

dissolving A blocks and B blocks terminated with respective isocyanate-reactive groups into a solution comprising at least one non-halogenated solvent selected from the group consisting of at least one organic ether, at least one organic ester, and at least one organic ketone, the A blocks being crystalline below about 75°C and derived from monomers comprising at least one member selected from the group consisting of oxetane derivatives and tetrahydrofuran derivatives, the B blocks being amorphous above about -20°C and derived from monomers comprising at least one member selected from the group consisting of oxetane and derivatives thereof, tetrahydrofuran and derivatives thereof, and oxirane and derivatives thereof;

drying the dissolved A blocks and the dissolved B blocks of water by azeotropic distillation of the at least one non-halogenated solvent;

end-capping the dried A blocks and the dried B blocks in the at least one non-halogenated solvent by reacting the dried A blocks and the dried B blocks with at least one diisocyanate in which a first isocyanate moiety thereof is substantially more reactive with the terminal groups of the A blocks and the B blocks than a second isocyanate moiety thereof, wherein the more reactive first isocyanate moiety is capable of reacting with the terminal groups of the A blocks and the B blocks, leaving the less reactive second isocyanate moiety free and unreacted; and

linking the end-capped A blocks and the end-capped B blocks together in the at least one non-halogenated solvent with at least one linking compound comprising two isocyanate-reactive

groups which are sufficiently sterically unhindered to react with the free and unreacted isocyanate moieties of the end-capped A blocks and the ~~end-capped~~ end-capped B blocks.

2. (Previously presented) The method as defined in claim 1, wherein dissolving A blocks and B blocks terminated with respective isocyanate-reactive groups into a solution comprises separately dissolving the A blocks and the B blocks into respective solutions.

3. (Previously presented) The method as defined in claim 1, wherein end-capping the dried A blocks and the dried B blocks in the at least one non-halogenated solvent comprises separately end-capping the A blocks and the B blocks in the respective solutions.

4. (Previously presented) The method as defined in claim 1, wherein dissolving A blocks and B blocks terminated with respective isocyanate-reactive groups into a solution, drying the dissolved A blocks and the dissolved B blocks, end-capping the dried A blocks and the dried B blocks, and linking the end-capped A blocks and the end-capped B blocks are conducted in the absence of a halogenated solvent.

5. (Cancelled)

6. (Previously presented) The method as defined in claim 1, wherein dissolving A blocks and B blocks terminated with respective isocyanate-reactive groups into a solution comprises dissolving the A blocks and the B blocks in an organic ether that comprises at least one member selected from the group consisting of tetrahydrofuran, ethylene glycol dimethyl ether, and 1,4-dioxane.

7. (Previously presented) The method as defined in claim 1, wherein dissolving A blocks and B blocks terminated with respective isocyanate-reactive groups into a solution comprises dissolving the A blocks and the B blocks in tetrahydrofuran.

8. (Cancelled)

9. (Previously presented) The method as defined in claim 1, wherein dissolving A blocks and B blocks terminated with respective isocyanate-reactive groups into a solution comprises dissolving the A blocks and the B blocks in ethyl acetate.

10. (Cancelled)

11. (Previously presented) The method as defined in claim 1, wherein dissolving A blocks and B blocks terminated with respective isocyanate-reactive groups into a solution comprises dissolving the A blocks and the B blocks in methyl ethyl ketone.

12. (Previously presented) The method as defined in claim 1, wherein linking the end-capped A blocks and the end-capped B blocks together in the at least one non-halogenated solvent with at least one linking compound comprises linking the end-capped A blocks and the end-capped B blocks with at least one linking compound derived from at least one diisocyanate and at least one difunctional urethane oligomer comprising two functional groups which are reactive with isocyanate moieties of the at least one diisocyanate.

13. (Currently amended) The method as defined in claim 1, wherein:
end-capping the dried A blocks and the dried B blocks in the at least one non-halogenated solvent with at least one diisocyanate comprises end-capping the dried A blocks and the dried B blocks with at least one diisocyanate in which the first isocyanate moiety of the diisocyanate is at least five times more reactive with the terminal groups of each of the A blocks and the B blocks as the second isocyanate moiety, wherein the more reactive first isocyanate moiety is capable of reacting with and ~~end-capping~~ end-capping the terminal groups of the A blocks and the B blocks, leaving the less reactive second isocyanate moiety free and unreacted; and

linking the end-capped A blocks and the end-capped B blocks together in the at least one non-halogenated solvent with at least one linking compound comprises linking the end-capped A blocks and the end-capped B blocks with the at least one linking compound that has two isocyanate-reactive hydroxyl groups which are sufficiently sterically unhindered to be reactive with the free and unreacted second isocyanate groups of the end-capped blocks.

14. (Currently amended) The method as defined in claim 1, wherein end-capping the dried A blocks and the dried B blocks comprises reacting the dried A blocks and the dried B ~~block~~ blocks with a diisocyanate that comprises toluene diisocyanate.

15. (Previously presented) The method as defined in claim 1, wherein the thermoplastic elastomer has a weight average molecular weight of at least 40,000 and a number average molecular weight of at least 10,000.

16. (Previously presented) The method as defined in claim 1, wherein the thermoplastic elastomer has a weight average molecular weight of at least 60,000 and a number average molecular weight of at least 12,000.

17. (Previously presented) The method as defined in claim 1, wherein the thermoplastic elastomer has a weight average molecular weight of at least 80,000 and a number average molecular weight of at least 15,000.

18. (Previously presented) The method as defined in claim 1, wherein dissolving A blocks and B blocks terminated with respective isocyanate-reactive groups into a solution comprises dissolving the A blocks and the B blocks terminated with respective hydroxyl groups as the isocyanate-reactive terminal groups into a solution.

19. (Previously presented) A method of making an energetic composition, comprising:

dissolving A blocks and B blocks terminated with respective isocyanate-reactive groups into a solution comprising at least one non-halogenated solvent selected from the group consisting of at least one organic ether, at least one organic ester, and at least one organic ketone, the A blocks being crystalline below about 75°C and derived from monomers comprising at least one member selected from the group consisting of oxetane derivatives and tetrahydrofuran derivatives, the B blocks being amorphous above about -20°C and derived from monomers comprising at least one member selected from the group consisting of oxetane and derivatives thereof, tetrahydrofuran and derivatives thereof, and oxirane and derivatives thereof;

drying the dissolved A blocks and the dissolved B blocks of water by azeotropic distillation of the at least one non-halogenated solvent;

end-capping the dried A blocks and the dried B blocks in the at least one non-halogenated solvent by reacting the dried A blocks and the dried B blocks with at least one diisocyanate in which a first isocyanate moiety thereof is substantially more reactive with the terminal groups of the A blocks and the B blocks than a second isocyanate moiety thereof, wherein the more reactive first isocyanate moiety is capable of reacting with the terminal groups of the A blocks and the B blocks, leaving the less reactive second isocyanate moiety free and unreacted;

linking the end-capped A blocks and the end-capped B blocks together in the at least one non-halogenated solvent with at least one linking compound comprising two isocyanate-reactive groups which are sufficiently sterically unhindered to react with the free and unreacted isocyanate moieties of the end-capped A blocks and the end-capped B blocks; and

blending the thermoplastic elastomer with about 50 wt% to about 95 wt% of at least one solid selected from the group consisting of fuel particulates and oxidizer particulates.

20. (Previously presented) The method as defined in claim 19, wherein dissolving A blocks and B blocks terminated with respective isocyanate-reactive groups into a solution comprises separately dissolving the A blocks and the B blocks into respective solutions.

21. (Previously presented) The method as defined in claim 20, wherein end-capping the dried A blocks and the dried B blocks in the at least one non-halogenated solvent comprises separately end-capping the A blocks and the B blocks in the respective solutions.

22. (Previously presented) The method as defined in claim 19, wherein dissolving A blocks and B blocks terminated with respective isocyanate-reactive groups into a solution, drying the dissolved A blocks and the dissolved B blocks, end-capping the dried A blocks and the dried B blocks, and linking the end-capped A blocks and the end-capped B blocks are conducted in the absence of a halogenated solvent.

23. (Cancelled)

24. (Previously presented) The method as defined in claim 19, wherein dissolving A blocks and B blocks terminated with respective isocyanate-reactive groups into a solution comprises dissolving the A blocks and the B blocks into at least one organic ether selected from the group consisting of tetrahydrofuran, ethylene glycol dimethyl ether, and 1,4-dioxane.

25. (Previously presented) The method as defined in claim 19, wherein dissolving A blocks and B blocks terminated with respective isocyanate-reactive groups into a solution comprises dissolving the A blocks and the B blocks into tetrahydrofuran.

26. (Cancelled)

27. (Previously presented) The method as defined in claim 19, wherein dissolving A blocks and B blocks terminated with respective isocyanate-reactive groups into a solution comprises dissolving the A blocks and the B blocks into ethyl acetate.

28. (Cancelled)

29. (Previously presented) The method as defined in claim 19, wherein dissolving A blocks and B blocks terminated with respective isocyanate-reactive groups into a solution comprises dissolving the A blocks and the B blocks into methyl ethyl ketone.

30. (Previously presented) A method of making a rocket motor propellant comprising making an energetic composition as defined in claim 19.

31. (Previously presented) A method of making a gun propellant comprising making an energetic composition as defined in claim 19.

32. (Previously presented) A method of making an explosive comprising making an energetic composition as defined in claim 19.

33. (Previously presented) A method of making a gasifier comprising making an energetic composition as defined in claim 19.